

Name: _____

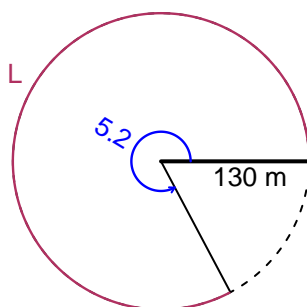
Date: _____

Trig Final (TEST v640)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

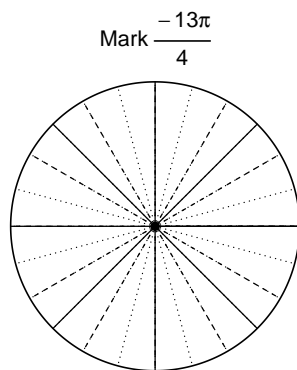
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 130 meters. The angle measure is 5.2 radians. How long is the arc in meters?

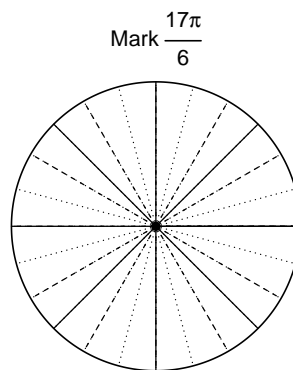


Question 2

Consider angles $-\frac{13\pi}{4}$ and $\frac{17\pi}{6}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(-\frac{13\pi}{4}\right)$ and $\sin\left(\frac{17\pi}{6}\right)$ by using a unit circle (provided separately).



Find $\cos(-13\pi/4)$



Find $\sin(17\pi/6)$

Question 3

If $\tan(\theta) = \frac{55}{48}$, and θ is in quadrant III, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with an amplitude of 3.11 meters, a frequency of 7.57 Hz, and a midline at $y = -5.83$ meters. At $t = 0$, the mass is at the maximum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).